



Ohio Department of Administrative Services

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Washington, D.C.

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In the Matter of)	
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The Development of Operational)	WT Docket No. 96-86
Technical, and Spectrum)	
Requirements for Meeting)	
Federal, State and Local Public)	
Safety Agency Communication)	
Requirements Through the)	
Year 2010)	

COMMENTS OF THE STATE OF OHIO, DEPARTMENT OF ADMINISTRATIVE SERVICES

The Department of Administrative Services is a client service agency providing a full range of services to all departments of State government, ranging from facility maintenance, architectural design, complex systems planning and procurement. A major project under way at present in the Division of Computer and Information Services is planning, procurement and implementation of a statewide Multi-Agency Radio Communications System (MARCS).

The referenced document contains numerous numbered paragraphs/sections. As much as possible these comments will follow the same format.

1. The State of Ohio commends the Commission for recognizing that deficiencies exist in the various public safety radio services and is pleased to submit these comments to aid in finding a suitable solution. We (Ohio) have a very strong interest in this proceeding as we are in the procurement stage of a new 800 MHz. voice and data radio system to serve all agencies of state government.

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2. Due to budget and staffing constraints, the State was not able to actively participate in the Public Safety Wireless Advisory Committee (PSWAC), however, we have employees who are members of the various organizations involved (APCO, FCCA, AASHTO) and are participating through these organizations as much as possible.

3. We agree with the Commissions assessment that there is no single answer to all public safety needs. With constantly changing priorities, locally, regionally and statewide, coupled with ever changing and improving technology, by the time a “standard” was in place, it would likely be technologically two or three generations outdated. Each entity needs to have the flexibility to determine, based on such items as area, budget and scope of need vs responsibility, what will work best for them.

4. This section contains the six general areas of discussion. Our broad scope response follows and is discussed in more detail in section IV. (1) Interoperability issues: require type accepted equipment to be able to operate in the analog voice mode on all current and future “common” or mutual aid channels. (2) Operational issues: provide channels of a predetermined maximum bandwidth (i.e. 25 KHz.) and allow the marketplace and users the latitude to determine what they need to effectively perform their duties, given the bandwidth available. In this manner, needed technology will develop, unneeded will not. (3) Technology issues: these comments are similar to (2), (4) Spectrum allocation: Commission to reserve spectrum above 869 MHz., at one time allocated to television channels 80 through 83. According to the frequency allocation tables in 47 CFR parts 2.106 the contiguous frequencies are assigned to the Domestic Public Cellular Radio Service (at part 22.902). Perhaps before the emerging personal communications services expands, as it certainly appears it will, re-locate some of the existing cellular services to that band and allow spectrum for the public safety services to expand. We realize that this will not be an easy task to accomplish but it might be easier now than later. Periodically (perhaps every five years) examine use of existing spectrum and, as more is truly needed, add blocks of channels from this contiguous reserve. (5) Transition: by allowing user groups/coordinators more involvement in regulation, we believe this will be self motivating and will occur naturally. As users, who knows the need to be spectrally efficient better than us? We readily admit that this was not always the case, however. (6) Competition in the supply of goods and services: we feel that generally, competition exists where the older, lower frequency bands are concerned. At 800 MHz., the currently available trunking protocols all have good points. By requiring manufacturers to also make available equipment utilizing each others protocols,

competition would be assured. This would, however, require technology sharing agreements and would no doubt be resisted.

16. The observation that the communications capability of the nation's public safety agencies is severely challenged is true. Today's by-word is "do more with less." "Less" will only stretch so far. Within reason, relaxation of stringent regulations concerning public safety communications would certainly assist those charged with safe-guarding the public welfare.

17. The State of Ohio, through employees in several agencies, took an active role in the National Plan's Region 33 proceedings. That process worked well, however; Ohio is among the top 10 states in the country in radio density and finds that already much of the 6 MHz. allocated is obligated. Comments at 4 (4) reflect one way to alleviate this problem however, other methods must certainly exist. Although time consuming, the "finders preference" has proven beneficial to some agencies as well.

18. From our review of the 1995 Public Safety Report, we too concluded that the Commission needed more information from the public safety community. For that reason, the State of Ohio is pleased to participate in this proceeding. We appreciate your goal of creating an environment enabling public safety agencies have the resources to carry out their mission of protection and service to the public. We sincerely hope that our comments, and those of other participants, will aid you in this process.

Interoperability issues

21. Ohio has long been cognizant of the need for interoperability. For many years, the "Ohio Plan" for public safety communications on low band, high band and UHF, had dedicated common frequencies (we called them mutual aid channels) though most were not specified or required in the Commission rules. In the 800 MHz. planning process, this need was addressed by NPSPAC. The State of Ohio, in conjunction with implementation of its own statewide 800 MHz. system, will provide base station equipment on the NPSPAC common channels for any agencies use, as well as maintaining the previous mutual aid services on the lower bands. In Ohio, there should not be any complaints about a lack of interoperability, regardless of equipment brand or technology in use. Interoperability among State agencies, one of the driving forces behind our system, will also be greatly enhanced. The ability to pre-assign tactical talk groups for mitigating emergency situations which require resource sharing from multiple state and local agencies will be achievable in a much more

efficient and timely manner. Mobile data, “mugshots”, fingerprints and other enhancements planned in conjunction with the FBI’s NCIC-2000 initiative are also important issues and valuable tools and are included in our plan.

22. While it is true that public safety systems are scattered across all the bands, various state and local entities have long had agreements with numerous Federal agencies to allow for intercommunication, either directly on a local agency system or on the statewide mutual aid channels. The State has every intent to continue this concept as we migrate to 800 MHz.

23/24 The State of Ohio agrees with both the current and proposed PSWAC public safety definitions.

25. We agree that “public safety” means much more than the average lay-person thinks of when hearing the term. As is noted by the Commission, utility services are certainly within the umbrella of “public safety” in emergency or disaster situations. The rapid restoration of services is of the utmost importance for the welfare of our citizens.

26. The PSWAC proposed definitions of “interoperability” are certainly accurate. All of the examples set forth have been included in the design of the new State of Ohio system. As mentioned supra, we intend to install the NPSPAC common channels throughout the State for the use of any public safety entity. Early emphasis will be given to those areas which currently have 800 MHz. systems but eventually the entire State will have the capability.

27. We agree with the definitions proposed and plan to incorporate them all. To do less, in a project of the magnitude of ours, we feel would be irresponsible. In this configuration, since these stations would be conventional analog and stand-alone, it becomes irrelevant what make of radio an agency uses.

28/29/30. The scenarios discussed in these captions are nearly identical to our thought processes of several years ago when first planning our system. We have never had true interoperability, as we now understand the word. An agency either had to utilize dispatch to dispatch phone calls for relay to the mobile units or equip their vehicles with multiple radios. With today’s technology at 800 MHz., real-time interoperability can be easily achieved by pre-programming certain talk groups for multiple agency response to emergencies or by use of the designated common channels.

33. The planned Ohio system is much like the systems described in paragraph 32, including cooperation with the power utilities. As an example, one method of cost containment we plan on utilizing is sharing of resources with various utility providers. In return for tower space, we will permit and encourage direct communication between a utility operations center and the State's Emergency Management Agency. We see this as a win-win situation; the State gets a cost effective tower location, the utility gets the emergency coordination point of contact they need and the citizens benefit from both.

38. The various schemes of arriving at universal interoperability, while having merit, also have problems. As mentioned supra, there is no one clear-cut answer that will work for all. Because of governmental budget constraints and funding availability, the relocation scenario discussed at 34 would take many years to complete. Universal mutual aid channels as discussed at 36 would be fine if 34 was fully implemented. Otherwise, it would likely require multiple radios in a public safety vehicle, one of the current conditions we are trying to alleviate. With all the mutual aid channels on one band, some agencies still will not have the capability, or funding, to participate. We believe that the 'Ohio plan' method of designating mutual aid channel(s) in each band is superior. Many sheriff's monitor the low band (usually 39.46 MHz.), the Highway Patrol monitors the VHF high band (the dedicated Ohio Law Enforcement Emergency Radio Network [LEERN] on 154.935 MHz., the administrative interagency frequency of 155.370 MHz., and, in some cases, the NLEF on 155.475 MHz.), while many large cities/counties on UHF utilize 460/465.500MHz. 155.805 MHz. is the designated emergency management frequency for state/local coordination and is monitored in many localities as well as at the State EOC. With the implementation of the new State of Ohio system, the 800 MHz. common channels will be provided for as well, so no potential users will be left out. We also intend to make equipment similar to your discussion at 37 available, however not in a repeater mode. By utilizing the existing high band LEERN equipment and a feature called "cross channel rebroadcast", agencies from multiple disciplines can still talk, albeit in the simplex mode. The known costs to implement what is described, we feel, will be negligible since much of the equipment planned is software programmable and feature rich. There may be some interface expense but we feel it will be more of a technician time issue than hardware cost. If necessary, local regulatory issues can be addressed by our LEERN steering committee, which operates under the umbrella of the State Attorney General's office. The frequencies are licensed to the State Highway Patrol and, pursuant to rule section 90.421(B), there are non-police entities already operating on the network for this very purpose.

39/40. We cannot agree totally with your conclusion that a block of channels in any one band will solve the inter-operability problem. We believe that many other States have a mutual aid arrangement similar to Ohio's which may be revealed with this proceeding. One of the major problems we see with this scheme is what band to pick from? Ohio public safety services operate potentially in seven (7) bands including the 420's and 470's. Between the statewide systems discussed supra and the Ohio plan utilizing "Mobile Radio Districts" we have considerable interoperability even to the multi-jurisdictional and federal agency level.

41. We suggest analog FM be the emission of choice for any designated common channels. With the differences in protocol at 800 MHz. we don't see any other way to insure its viability. All manufacturers produce equipment on the lower bands in this mode enabling the use of (generally) any radio on any system. The current 800 MHz. equipment, in order to operate on the five NPSPAC common channels in the 866-869 MHz. band, also operate in analog FM as well as their proprietary protocol. Therefore, it makes sense to continue in this mode rather than try to impose a new scheme. With digital technology perfected, it will likely migrate backward to the lower bands (if it has not done so already), so it would be prudent to require the ability to operate on the common channels in the analog mode in those bands as well.

We agree that the Commission should require public safety radios to be able to operate on the designated mutual aid channels as they do at 800 MHz. It is doubtful that this would add much to the cost of the equipment and would be extremely beneficial. The effective date should be immediate and manufacturers who currently produce software programmable radios should be required to provide a program for existing radios to enable this critical feature or show cause why they are unable to do so. Twenty plus years ago, at least one manufacturer offered a "multi-band" radio (actually two chassis' combined and interfaced to a single remote control) which is still used extensively in Ohio. It was, however; robust enough to withstand the rigors of day to day public safety use. The amateur multi-band equipment we have seen would not survive long in this environment but if the demand (or regulation) was there, the manufacturers would no doubt 'harden' the product. This avenue would indeed provide an expedient solution to interoperability *for those who could fund them.*

1. Service features

47. As mentioned earlier at 4 (4), the frequencies above 800 MHz. have already been re-allocated from TV

channels 70 through at least channel 80. The upper three MHz. of the national plan (NPSPAC) band, 866 to 869 MHz. is one-half of what was TV channel 80. In reviewing chapter 47, Code of Federal Regulations, part 2, United States table for non-government allocations, 869-894 MHz. is covered in FCC part 22, domestic public land mobile. Subpart K, Domestic Public Cellular Radio Service shows a frequency allocation of 869.040 to 879.990 MHz. and 890.010 to 891.480 MHz., 416 channels over 12.42 MHz. of spectrum. This is only one block, there are two similar blocks per MSA/RSA totaling 832 channels, nearly 25 MHz. of spectrum, or nearly 50 MHz. When you consider the mobile input side, spaced 45 MHz. down. We acknowledge that cellular telephony holds an important place in today's world but it appears to us to be somewhat lopsided to have public safety with only 300 channels and 9.5 MHz. of spectrum in this band (your numbers at 15). These channels are assigned regionally and not all are available in any given area. Another important factor is the considerable difference in operational disciplines. Cellular desires shorter range per site, lower power and shorter antennas thus allowing for maximum channel re-use, public safety needs more range, more power and taller antennas for wide area coverage therefore the ability to re-use is diminished.

While we generally agree with your statement that not all of public safety's needs can be met solely with the addition of spectrum, the currently available enhancements to assist in the protection, preservation and improvement of the public welfare are, for the most part, unusable to many agencies due to the lack of spectrum. Your lead Statement at 47, "public safety spectrum is currently congested" is becoming more acute daily. As guardians of the public dollar, it is not prudent or cost justifiable for a governmental agency to spend the time (money) to research and develop enhanced applications if there is no known spectrum for them to operate.

49. The applications cited at 48 are indeed important and we plan to incorporate most of them. Fingerprints and photographs with the NCIC-2000 initiative as well as interconnect and status messaging to name a few. Full motion video would aid in emergency management and has in fact been discussed off and on over the past few years. Both equipment cost and lack of available spectrum usually made the discussions brief. Mobile computing i.e. full data exchange with host computers is needed. More than just brief NCIC inquiry type transactions; access to local and national hazardous materials files, Chemtrec information as well as a variety of

agency mainframes, will enable our employees to be more responsive to our citizens. Most of these enhancements are unusable in current systems due to lack of bandwidth and/or excessive channel congestion. New, high technology and spectrally efficient systems are needed to support these applications as well as an increased number of users. The use of commercial providers has not generally proven satisfactory for public safety due to a general lack of known reliability, no prioritization of users (a cement truck calling 'on the job' has the same priority as a paramedic receiving advanced life support instructions from an emergency room physician) and frequently, a lack of coverage in rural and difficult terrain areas. During a disaster situation when utilities are likely to be interrupted, cellular systems rapidly become saturated with users. If the PSTN has been compromised, the cellular and SMR systems could be out of service.

50. For an integrated system such as we are developing for State agencies, the service requirements do not vary with demographics. Most of our users have a law enforcement or life safety mission. Our largest user, not surprisingly, will be the Highway Patrol. Though their activities occur mostly on rural roadways, their plain clothes officers investigate a variety of criminal activities in suburban/urban areas. Game wardens, watercraft officers and park rangers in the Department of Natural Resources operate mostly in remote rural locales. Liquor control officers and food stamp fraud investigators do most of their work in the cities. The Emergency Management Agency could be called into to any area to assist city or county disaster service workers. A prison guard needs hand-held communications in an environment unfriendly both socially and structurally. Those facilities are normally steeped with thick steel reinforced concrete, not at all friendly to low power RF transmission. Their commonality is the need for immediate access to the system in place and to be able to intercommunicate with others in mitigating any situation at hand.

51. The designed system has to be able to handle multiple situations in both close and wide areas. One example is a spring tornado. Ohio is in "tornado alley", a band that stretches across the midwest from the great plains states. This killer phenomenon can range from one brief isolated touchdown, a hop-skip series or an extended touchdown with a wide swath of destruction. The communications system has to be able to handle the needs of such an incident as well as the on-going day to day activities that don't stop just because of a storm. These needs for capacity, reliability, coverage and range are indeed key factors which must be addressed. This brings us back to our comments at 47. Based on criticality, currently there is not a equitable distribution of spectrum for public safety at 800 MHz. Critical to systems and equipment both is the ability to communicate on any designated common or mutual aid channels, regardless of frequency band, and in the designated emission mode. Again we suggest analog FM as discussed at 41. This has been done with the current 800 MHz.

equipment. From the regulatory side, automatic authorization on these designated channels when a license for an operational system is issued would simplify the filing procedures.

52. Your comments are entirely accurate. Ohio state government agencies, for the most part, operate independent systems constructed over the years though some are shared with smaller, low volume user agencies. Their one common thread is that they are nearly all based on 50 year old technology. They are all at the point where massive upgrades are needed just to carry on their daily business. We realized several years ago that investing new money into old technology was not the fiscally responsible answer.

53/54. Your narrative at these points is exactly why Ohio state government is on its current path.

55. When Ohio started studying the benefits of the new technology, a “user group” was formed, consisting of agencies who had the need for radio communications. Over several years this group has defined and refined their needs and, for the most part, they are nearly identical. The larger users (Highway Patrol, Natural Resources, Emergency Management) needed reliability, wide area coverage and enhanced features. The smaller agencies knew that if a system was in place meeting the needs of the larger users, it would be better than anything they could have obtained on their own. Our Corrections Department, on the other hand, needs handheld coverage in localized, confined areas. We will install small conventional systems at their locations, yet still make the wide area system available for their prisoner transport vehicles.

Technology issues

57. We have been watching the emergence of satellite technology for some time and, according to recent material, it has arrived. Cost factors (2 or 3 times) and lack of proven reliability for a system the size of ours, however, do not presently make it a viable alternative. Perhaps a small, non-emergency response agency could benefit. From the descriptions we see, wide area coverage does not appear to be a problem.

The development of new technologies and services do not automatically mean more spectrum is needed if the existing bandwidth is satisfactory. Our planned system is based on 851 MHz. channels for the data portion. We know that NCIC-2000 is coming and that we will participate, however, no one has been able to tell us what technology will be used/needed for the fingerprint and photograph transmission or reception on the street. Our feeling is that we need to be prepared with 25 KHz. channels to accommodate it, if needed.

63. We feel that any of the transmission technologies discussed at 59, 60 or 61 would be satisfactory for our needs. TDMA (59) or FDMA (61) are the most likely prospects and are the most used in private land mobile systems. Our request for proposal for the new State system does not express a preference since to do so would negate any hope for a competitive bid by effectively specifying a vendor. We would reserve comment on additional technologies until the PSWAC completes its investigation of the possibilities.

64. We are examining sectorized antennas (probably 240 degree), however, not for the purpose you describe. Our likely use would be along the borders with adjacent States to minimize the potential for interference to them.

65. We have no doubt that trunking increases spectrum efficiency. In a consolidated governmental operation, there are numerous working groups with varied "busy" hours. Service related groups are generally active between 8am and 5pm, law enforcement is busiest in the night season and fire/EMS is usually spread around the clock. With dedicated channels, there would be a local government system idle 15-16 hours a day, a police system busiest after dark and a fire system in use all the time. In a trunked environment, fewer channels would have fairly constant use evenly spread among them all. Antenna design will aid us not so much in increased capacity as in increased efficiency and protection. As discussed above at 64, a 240 degree antenna will help minimize potential interference to adjacent States. Downtilt antennas will help fill in holes in hilly terrain by concentrating some signal down while still maintaining a somewhat omni-directional pattern.

66. We tend to agree that, at least sometimes, less regulation is better, particularly in a specific user oriented environment. However, no regulation is seldom good in any situation, especially one so technical. As we Stated at 41 and 42, the Commission should require operational ability on the common channels in each band and automatic authorization on those channels for licensee's.

67. The Commission should continue to examine and type accept (or reject) new technology for suitability then let the users decide what will work best for their particular need. We think that involving the frequency coordinators in the process is good, however, getting them involved in the technical design of each and every system would be ill-advised. The State of Ohio has always been supportive of, and involved in, our communications professional organizations, AASHTO, APCO and FCCA. The chairman of the national AASHTO frequency coordination committee (and the Ohio coordinator) is a State employee. He was recently

named as the next chair of the Land Mobile Communications Council as well. Both APCO frequency advisors are State employees while the FCCA coordinator for Ohio is a Michigan State employee. These people serve more or less as volunteers to aid their parent organization (actually the only recognized point of contact for the Commission) in order for there to be some local input in the process. A computerized data base in another part of the country can't compensate for a lack of that local knowledge. While the State is supportive of their present activities, they do have other duties to perform as well. We would rather they not get involved in individual agency system design. While helpful, a technical or radio engineering background is not essential to the coordinating task, therefore it could involve a liability issue also. A responsible vendor or engineering consultant could advise the applicant as to the best technology for the intended use.

68. NTIA's point is well taken. It behooves the manufacturer's to not build or sell inferior receivers since they are a partner with the users in the overall quest for spectral efficiency. Even with highly selective receivers, we have found places in the large metropolitan areas where there is such a heavy concentration of RF, serious degradation can occur. As part of the type acceptance process, perhaps minimum standards should be required.

Spectrum allocation

71. NTIA is in a much better position to estimate the amount of spectrum needed in the future than are we. As more agencies migrate to 800 MHz., spectrum will be made available at the lower frequencies for reassignment. Ohio State agencies may potentially return over 70 frequencies, some of them statewide. Then the question becomes, will anyone want them, since most of them are at low and high band VHF? The same problem will exist for others then as exists now, the same factors that is driving the State of Ohio (and others) to 800 MHz. Implementation of current and emerging technology features, for the most part, are not feasible at VHF due to bandwidth limitations.

72. (a) Since it is an acknowledged fact that it would be detrimental to continue fragmenting the public safety radio services, the only way we can see to not continue and compound this problem would be to relocate the cellular service and reallocate the spectrum immediately above 824/869 MHz. to land mobile. We fully realize that a great furor would be raised by the cellular industry, however, this would provide contiguous additional spectrum for land mobile including public safety. Forced relocation by the Commission is not without

precedent as any of the estimated 700 State and local government licensee's (including many in public safety) who operate 2 GHz. microwave facilities can attest.

(b) As to where to relocate cellular, perhaps to some of the spectrum currently assigned to the federal government and scheduled for release by NTIA. By relocating both "a" and "b" cellular services and placing the nearly 50 MHz. (our numbers at 47) in a land mobile reserve pool, with a significant portion earmarked for public safety, spectrum needs should be satisfied for years to come *and it exactly coincides with NTIA's estimation of additional spectrum needs at 71.*

(c) More and more agencies are moving towards sharing on their own, where 10 or 15 years ago this was unheard of. Today, it is becoming more and more commonplace. As mentioned, the State of Ohio is constructing a shared system, currently with 14 agencies involved. Several city/county, city/city or all city shared systems in Ohio are either in place or planned as well. Placing a "requirement" to share might have an adverse effect, however, inducements or incentives could be offered to those who do want to share. Such things as accelerating the licensing process or easing the channel loading requirements are initial thoughts.

(d) Our feeling is that the community as a whole, users and manufacturers alike, are much more aware of the need for spectrum efficiency now than 10 years ago, and appear to be moving that way on their own. As with system sharing, making it a requirement might have a negative result.

(e) As noted at 49, most governmental entities tend to stay away from commercial services due to lack of known reliability, often poor coverage in rural areas, no fixed (budgetable) costs and lack of priority among users. We have, and will continue to maintain dialogue with the commercial side in other matters, such as tower sharing, which can be of benefit to all concerned.

(f) As mentioned at (c) an incentive program might be beneficial, particularly at 800 MHz. Since most other bands wherein public safety operates (VHF, UHF) utilize 50 year technology, manufacturers haven't done much to improve the efficiency of the equipment, therefore not much can be done to improve efficiency in a system or the spectrum.

One other issue that might aid in the efficiency, capacity and capability of public safety communications systems is maintaining adequate support staff. Several times we have seen agencies not hesitate to add equipment and/or field staff (patrol officers, fire companies, EMS units, etc.) But seldom are there any increases in support staff (technicians, telecommunicators). Frequently, through normal attrition, vacancies will remain unfilled just because the work always seems to get done anyway. Administrators usually fail to notice the additional strain or workload placed on remaining support staff when these vacancies go unfilled. Then, if they manage their budgets well or receive a windfall near the end of the fiscal year, they'll not hesitate to put more people or equipment on the street. This is not often thought of as adding to system degradation but it can have a significant impact. Here in Ohio, we plan that the new system, through the use on mobile computing, will allow a reduction in telecommunicator staff, but it will require an increase in technical support staff. We try to keep an educated eye on the support staff / field staff / equipment ratio.

We have heard estimates that, in a police type voice conventional radio system, as much as 70% of the radio traffic is related to data inquiries. After a mobile computing training phase, we expect a significant reduction in voice radio traffic which will lead to less congestion and improved capacity over current operations.

73. By specifying the frequencies below 1 GHz. as congested, you imply that above 1 GHz. it is not congested. If this is indeed the case, it appears to be good candidate spectrum to move cellular. We disagree with your tentative conclusion that "additional spectrum is not likely to satisfy....". We are fairly fortunate here in Ohio as there has not been a mass migration to 800 MHz. but some parts of the country have no available spectrum. At 47 you say that ...not all of the communications needs can be met by allocation... implies agreement that some of the need can be met by allocation. At 48 you express belief "that public safety agencies should have access to the full range of available information services". You also "further believe that the following service features will be needed...in the future..." If there is not spectrum available currently, sufficient to permit expansion of existing systems or construction of new systems, how will agencies access these additional tools, some of which aren't even fully developed yet? We need PSTN interconnect but the voice dispatch and mobile data have priority. We are designing for NCIC-2000 features, such as fingerprints and mugshots, on the street but no one can tell us projected bandwidth requirements. The NTIA, at 71, predicts that 50 MHz. of additional spectrum will be needed for new land mobile services over the next 10 years. You did not refute that statement there, rather asking what commenters thought. We think that the NTIA is probably in a better position to overview the big picture than are we (relatively) smaller user agencies. Our view is somewhat limited by concentration on our budgets and missions, whereas NTIA (and FCC) would have a better idea of what the

future might hold throughout the entire industry. If additional spectrum, adjacent to the current, is reallocated from cellular, it would be contiguous, therefore your last issue becomes moot. One thing we do need to guard against, if at all possible, is obtaining additional spectrum so far removed from the current that one radio won't operate on both. This need for multiple radios is one of the major drawbacks to current operations in the lower bands.

74. Reallocation: this paragraph designates 135 MHz. of potentially available spectrum scattered between 1390 MHz. and 2450 MHz. for non-federal mobile communications.... Without having done any vendor research, we wonder if public safety suitable mobile equipment is available and at what cost? One would guess that, given the limited past market, costs might well exceed the available resources. State and local government entities, as guardians of the public dollar, don't generally wish to pay for new technology development. What about the other users listed? Who would be primary and who would be secondary? Public safety in the past has not had to cope with secondary users in their bands to any great extent, nor should they. Clear channels are essential to assure the passage of emergency communications.

75. Any or all of the 42 MHz. between 174 and 216 MHz. could be beneficial to public safety due to its adjacency to the existing VHF high band spectrum. Agencies utilizing wide area systems would greatly benefit due to the greater range as opposed to UHF/800 MHz. If sufficient channels and suitable equipment were available, we (Ohio) would certainly consider this over migrating to 800 MHz. for our statewide system. The same holds true for the DPLMS listed frequencies as well.

76. As before, the usability of the 2110-2120 MHz. spectrum depends on availability of suitable off the shelf (hereafter OTS) equipment. We can't pay for new technology development. Perhaps return it to fixed microwave use to replace some of the spectrum recently reassigned.

77. Again, the issue is suitable OTS equipment.

78. (a) It is very difficult for us, as it is for the Commission, to estimate the additional spectrum needs in the various time periods stated, however; the public demand for service will certainly continue to increase; the expansion of our urban areas will, in all likelihood, continue and this will cause the need for additional public safety response personnel. Additionally, the executive branch of government is planning to place 100,000 (plus

or minus) more police officers on our streets. Some departments cannot communicate effectively now. Additional users will only exacerbate the problem.

79. System sharing by use of advanced technologies is the basis for our proposed Statewide system. At least 14 agencies of State government will, by pooling resources, enjoy much better and efficient communications than any one agency now has or could afford on its own. If additional spectrum were to become available, we could be open to perhaps sharing this enhanced capability with federal and local entities as well. As stated at 73, the new spectrum needs to be operationally compatible with a single radio environment.

80. The State of Ohio recognizes the need for spectrum efficient systems. That is why we are opting for a 800 MHz. trunked system for our new multi-agency network. The technologies available now will greatly enhance our ability to serve the citizenry and make our operations more cost effective and efficient. For the most part the technological enhancements that will allow us to do this are not generally adaptable to operation in the lower frequency bands.

We feel that TDMA and FDMA are the most spectrum efficient for public safety systems. ACSSB has shown some benefit on the lower frequencies, as well. We are not familiar enough with CDMA to address its possibilities.

81. Given sufficient spectrum, exclusivity for public safety systems is by far the most favorable. Since that is not likely, sharing with other public safety agencies is not only possible but is done currently. Various State agencies have permitted other similar entities limited operation on their systems. These are usually entities with similar response areas and mission responsibilities (i.e. hazardous material teams from the Motor Carrier Safety unit and Fire Marshal personnel operate on a Highway Patrol channel during incidents).

82. We would support NTIA's proposal of federal/nonfederal sharing, given sufficient spectrum. We would have no problem sharing our infrastructure with federal enforcement and/or safety agencies and in fact, we would probably encourage it since from past practice (we have limited sharing now) we know of the benefits. With the partitioning capabilities available in a trunked environment, each could retain its autonomy and still have the ability to communicate with each other in emergencies or routine joint operations.

83. We do not support NTIA's conclusion that public safety systems utilize cellular or PCS technology for future operations. Those systems are engineered on lower power, lower antenna height and many more sites. Cellular/PCS can do this because of the vast number of channels available to them. Public safety has far, far fewer channels available. Region 2 in Ohio, for example, has only 50 channels allocated to public safety. Region 3 has but 115 channels and encompasses some of the States major population centers.

84. We concur with NTIA's proposal to maintain independent user agency autonomy and end the fragmentation that has caused a great lack of interoperability. The Commission is correct in its observation that there is difficulty in obtaining public funding for capital projects (infrastructure), however; Ohio law prohibits joint public-private ventures in capital projects.

85. Administrating a shared federal / non-federal environment could be accomplished by offering incentives to participants, such as easing the licensing requirements and allowing actual combining of the 'frequency pools', especially those reserved for federal government operations, with local assignments. This would help ease the shortage of channels usually necessary for a large scale trunked system. We would see this occurring primarily in a statewide system, not city or county, to ease the administrative problems. With the current technology, partitioning of the users would permit privacy and maintain autonomy, yet give the users a full range of services on such a system. Some formula for sharing the infrastructure costs would need to be developed but that would probably have to be on a system by system basis.

Other issues become critical when planning a large scale system, among them equipment life cycles. Our agencies normally estimate ten years when purchasing new equipment, however; it usually remains in service for 15 to 20 years or longer. With today's software programmable equipment, the manufacturers should be required to provide upgrades periodically for an extended period of time. This might not be in their best financial interest, however; it would greatly benefit the taxpayers.

86. The consensus of the public safety community has long been the necessity to control one's own system or, at least (if sharing) control must lay with a similar, emergency oriented, organization. Commercial providers tend to look at all 'customers' equally and this is unacceptable in a emergency response situation. We read that within two to five minutes after the Oklahoma City Federal Building bombing, the cellular systems there became so jammed with calls, they were basically useless. Unless there is some legislated priority system in

place for public safety agencies, a commercial system is of little use, perhaps even detrimental, during an emergency. As Stated at 82, we do support government agency system sharing as is evidenced by our plan.

E. Transition

87. At 71 the Commission states that the goal of this proceeding is to ensure adequate spectrum is available for public safety agencies. In this same section, NTIA predicts 50 MHz. will be needed in the next 10 years for PLMS. At 87 you state the tentative conclusion that obtaining additional spectrum is unacceptable. These appear to be contradictory statements on the part of the Commission. True, there are immediate needs for additional spectrum and these need to be addressed first. Given today's technology, the Commission needs to locate some spectrum nearby the existing which would be technologically compatible with the single radio concept. Relaxation of some of the stringent existing frequency use rules would also be beneficial as well. In researching available frequencies for our planned statewide trunked system, we found numerous ones unused in various parts of the State. We are, however; unable to apply for them because of the freeze imposed by the wireless telecommunications bureau. We understand and support the original reason for the freeze but now the Commission appears to have the matter under control. We see no reason why, upon showing a need, plan and funding commitment, we should not be allowed to apply for some of these channels which are unused in their own service. Many of these are in remote rural areas where the demand for commercial services is not, and will not be, as great as the urban areas.

Since current equipment can be expected to last for 20 years or more, to set a date sooner than that could impose serious financial hardships on some agencies, particularly those who have recently purchased new equipment. 20 years is certainly realistic, given the difficulty the Commission states there will be in obtaining the additional spectrum. This would certainly give sufficient time for system planning and budgeting.

88. Your three views expressed at 88 are basically sound and continue to characterize the public safety community. We have discussed supra, our reasons for not wishing to become dependent on the available commercial services, especially given the fact that they don't exist in some areas where we must have service. Again, we maintain that the only suitable solution is to construct and control ones own system.

1. Increased use of commercial services

89. Again, remember your Statement at 71, also the congressional mandate of several years ago wherein they charged the Commission with ensuring that the spectrum needs of public safety were met. We do, and will, use commercial services “wherever feasible and possible”, but that will be very little, for administrative use only.

90. As we have stated supra, using commercial services for non-emergency, low priority communications can, and is, being done. We cannot, and will not, have a public safety officer in the field, perhaps in a life or death situation, endure a system busy indication on his radio because a cement truck driver is explaining a problem to his office. When the minimum APCO-16 standards (prioritization, emergency alerting, etc.) are available on commercial services, we may reexamine the issue.

It is true that the 1990's saw substantial allocations to the commercial services. Some we feel were at the expense of public safety (i.e. the reallocation of 2 GHz. microwave). Again, we feel that the Commission has not done all that it could to meet the congressional mandate regarding public safety spectrum needs.

2. Funding for spectrum management

91. We have discussed supra the issues surrounding additional spectrum, efficient use of spectrum, commercial services and sharing. Funding is indeed a significant issue, however in our case we saw that our system participants were using fifty year old technology and were all in need of massive upgrades. It was determined that the only cost effective plan would be to construct a new spectrally efficient, state-of-the-art system that everyone would share.

92. Many State agency users operate in the 30 to 50 MHz. band. Given the inherent technical anomalies associated with this frequency range (skip, atmospheric noise, etc.) unless everyone, nationwide, vacated a given frequency, it might not be of much value to the commercial sector and might indeed be detrimental to any existing public safety user. The VHF high and UHF bands might have more value and in most cases could be used regionally since the low band problems aren't as prevalent in the higher spectrum. At present though, many of the advanced technological features desired by commercial service users have not been fully developed

for use on these frequencies. Therefore, more refinement of these innovations needs to be accomplished by the manufacturers before these bands become user valuable.

If buyers could be found for the presently used spectrum and the proceeds were enough (both doubtful, in our opinion), just where would the present public safety users relocate to? The Commission gives seemingly contradictory thoughts throughout this document: *yes, public safety needs more spectrum; no, they don't need more spectrum and besides, there isn't any available to give them anyway*; and this makes it very difficult for us to understand just where the Commission is headed.

3. Improving public safety spectrum administration

93. We agree that the current licensing process is seemingly inefficient and cumbersome. From our association with APCO, it appears that the Commission has been satisfied with their overall performance in the coordination arena. Why then, could they not take a larger role in the process since it is doubtful that the Commission often reverses their approvals? The same might be true for the other service coordinators as well, however; we have no firsthand knowledge of their service records.

94. We fail to see how coordination post-grant would improve the situation over pre-grant coordination. There is a greater possibility of an entity investing in frequency specific equipment and then find post-grant that they cannot use the frequency they thought they could. The coordinators are required to process the vast majority of their applications within twenty working days. If the Commission would do likewise, there wouldn't be a problem for the users. Of late, some of our user agencies report a several month wait for seemingly simple license modifications which take a very minimum amount of coordination on APCO's part. The time delay appears to be at the Commission's licensing branch.

We agree that there is a continuing need to coordinate border frequencies with neighboring countries. We also see a need for the Commission, through whatever diplomatic channels are required, to try and improve the "speed of service" with these similar agencies. We have had agencies wait six months and more for Canadian clearances. We cannot speak to the speed of Mexican clearance, however.

F. Competition in the supply of goods and services

95. We can't help but think that the Commission is partly to blame for this situation by not mandating the technology or commissioning Project 25 before the proliferation of systems. We realize that when our new system is implemented, we will be 'married' to the one vendor, however; we are trying to mitigate this by writing price guarantee's, including those for new technological innovation, into the original contract. Most of the current manufacturers have signed sharing agreements with a variety of peripheral equipment suppliers and, hopefully, this will improve the product choice availability.

97. We agree that the Commission should be a party to the goal of fostering a competitive marketplace. Since the rules do not now mandate one technology over another (it appears to late to do that) perhaps the main issue should be to ensure interoperability standards, although these, too, could be forced by the users. As discussed supra, 25 KHz. analog FM appears the most suitable solution since it is already in use, all manufacturers have it, and users could make it a system requirement.

98. While we tend to agree with the goal of Project 25, as stated at 95, we feel that the Commission should have finalized this technology issue prior to releasing the spectrum. The project has taken too long and some users can't wait for it to be completed. We feel that either of the two major protocols will provide what we need and we are doing our best to provide for interoperability with users of the other (protocol).

99. If the Commission had set the protocol back in 1988 or earlier, public safety and the industry would not be fighting the battles that they are. The situation would be as in the lower bands and that has worked well. There would be no interoperability problem, competition would exist and spectrum efficient technologies could be jointly developed.

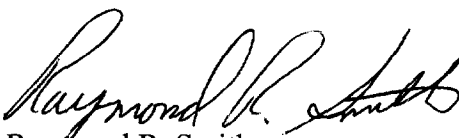
100. If a 'standard' is not mandated, then Ericsson's view that Project 25's outcome will further restrict competition may be accurate. Since each of the major manufacturers have a method for improving spectrum efficiency, we feel that will evolve as the marketplace demands. We have addressed the interoperability issue numerous times supra.

101. The Commission, by not addressing the issue in a positive manner in 1989, rather allowing a user driven proceeding to evolve too slowly, may have done the industry a dis-service. Other than mandating a method of

interoperability, we feel that the number of systems already in place is such that the taxpayers cannot, and should not, have to stand a replacement requirement if they happen to have the opposite of the protocol chosen.

V. Conclusion

The State of Ohio is pleased to submit the above comments to this proceeding and thanks the Commission for the opportunity to do so.



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RRS/WGR/pmm